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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SEDIGHIAN, REZA	
ART UNIT	**PAPER NUMBER**
2613	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/03/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/810,030	KROPP, JORG-REINHART	
	Examiner	Art Unit	
	M. R. Sedighian	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3/26/04, 5/20/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. This communication is responsive to applicant's preliminary amendments of 6/1/04. The amendments have been entered. Claims 1-23 are now pending.

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 12 and 14-15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specification does not clearly describe about a structure that is formed upon a carrier material and that is oriented in a specific direction relative to a crystal axis of the carrier material. Specification further does not clearly describe about the structured laser that emits radiation elements in higher-order oscillation mode having their radiant power predominantly away from an optical axis of radiation. Specification further does not describe about a separating structure that reduces oscillation modes having their radiant power predominantly about an optical axis of radiation.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 8-9, 12, 14, 15, 20, and 22-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As to claim 8, it is not clear what is meant by "... at least one separating structure forming a plurality of lasers out of said structured laser, ...". What does it mean by one separating structure forming a plurality of lasers out of said structured laser??

As to claim 12, it is not clear what is meant by a structure that is formed upon a carrier material and that is oriented in a specific direction relative to a crystal axis of the carrier material. What are the carrier material and the crystal axis of the carrier material??

As to claim 14, it is not clear how the structured laser emits radiation elements in higher-order oscillation mode having their radiant power predominantly away from an optical axis of radiation.

As to claim 15, it is not clear how the separating structure reduces oscillation modes having their radiant power predominantly about an optical axis of radiation.

As to claim 20, it is not clear what is meant by "... said beamforming element enlarges an optical image of said structured laser on said core ...". Specification describes (page 12, lines 1-5) the radiation 2 passes through a beamforming element in the form of a lens 5, on its way to a multimode optical conductor 3, and this broadens the radiation 2, which then arrives at an end surface 6 of a light conductor core 7 of the multimode optical conductor 3. What does it mean by a beamforming element that enlarges an optical image of the structured laser on the core??

As to claim 23, it is not clear what is meant by "... at least one separating structure forming a plurality of lasers out of said structured laser, ...". What does it mean by one separating structure forming a plurality of lasers out of said structured laser??

Double Patenting

6. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v. Eagle Mfg. Co.*, 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

7. Claims 1-6 are rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-6 of prior U.S. Patent No. 6,785,476. Both application claim a transmission configuration that is comprised of a transmitter for emitting radiation and having a plurality of individual lasers in a two-dimensional laser array for emitting radiation elements with coupled phases upon stimulation, and which are being operated simultaneously, and a multimode optical conductor for passing on the radiation emitted from the transmitter, having a core with a core center, wherein radiation elements entering the multimode optical conductor together, and wherein radiation elements entering symmetrically about an optical axis of the multimode optical conductor, and the emitted radiation enter the core predominantly away from the core center. This is a double patenting rejection.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claims 7, 10, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. (US Patent No: 5,048,027) in view of Scifres et al. (US Patent No: 4,688,884).

Regarding claim 7, Hughes teaches a transmission configuration (fig. 1), comprising: a transmitter for emitting radiation (8, fig. 1), the transmitter having a structure laser (col. 2, lines 3-12, col. 3, lines 64-66) emitting radiation elements with coupled phases upon stimulation (col. 3, lines 1-2, 67-68 and 9, fig. 1); the structure laser including at least one structure causing the radiation elements to produce at least one predetermined higher-order oscillation state (col. 2, lines 1-10, 32-37, col. 3, lines 8-11, col. 4, lines 4-7); an optical conductor (7, fig. 1) for passing on the radiation elements emitted from the transmitter (col. 3, lines 63-66); and wherein radiation elements entering the optical conductor together (col. 2, lines 45-62, col. 3, lines 64-66, the generated radiation elements entering the optical conductor 7 together for further transmission along the line to provide a single powerful laser beam). Hughes differs from the claimed invention in that Hughes does not specifically disclose the optical conductor is multimode optical conductor. However, it is well known to incorporate a multimode optical conductor as a transmission medium to convey the optical the signals. For example, Scifres teaches optical signals generated by a laser array (12, fig. 1) can be transmitted over a multimode optical conductor (14, fig. 1 and col. 3, lines 20-50). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to incorporate a multimode optical conductor such as the one of Scifres for the optical conductor in the optical transmission system of Hughes to allow more of the source light emission to be launched into the fiber and propagating high amount of energy.

Regarding claim 10, Hughes discloses the structured laser includes at least one laser mirror and the structure is formed by a modification of the laser mirror (col. 2, lines 5-11, col. 4, lines 58-63, the laser mirrors).

Regarding claim 18, Scifres discloses the multimode optical fiber (14, fig. 1) has a core (22, fig. 1) and core center (col. 5, lines 1, 8), and wherein the emitted radiation elements enter the core predominately in a predetermined distance from the core center (col. 4, lines 32-42, col. 6, lines 25-35, col. 8, lines 20-22).

10. Claims 8-9, 13, and 21-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. (US Patent No: 5,048,027) in view of Scifres et al. (US Patent No: 4,688,884) and in further view of Koyama et al. (US Patent No: 6,990,128 B2).

Regarding claim 8, as it is understood in view of the above 112 problem, the modified optical transmission system of Hughes and Scifres differs from the claimed invention in that Hughes and Scifres do not disclose the structure is configured as at least one separating structure forming a plurality of lasers out of the structured laser. Koyama teaches a method of manufacturing surface emitting semiconductor laser for optical information processing and optical communication systems (col. 1, lines 10-15), wherein a plurality of divided regions produce a light emitting spot corresponding to a specific oscillation mode (col. 3, lines 65-67, col. 4, lines 1-10, col. 9, lines 43-47, col. 15, lines 53-57 and figs. 1, 11). Koyama further teaches the light emitting spot can be divided into two spots, or four spots, or six spots (col. 10, lines 35-45 and fig. 1). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to provide a laser structure that forms a plurality of lasers out of the

structure, as it is taught and disclosed by Koyama, for the laser structure in the transmission system of Hughes modified by Scifres to provide a laser structure that permits light emission of a specific oscillation mode (Koyama, col. 5, lines 15-20).

Regarding claim 9, Hughes differs from the claimed invention in that Hughes does not specifically disclose the plurality of lasers are arranged in such close proximity to each other that the radiation elements form a higher-order oscillation mode. Hughes discloses a parallel array of laser oscillators which have one common output aperture (col. 2, lines 7-8). Hughes further discloses the quality rod and slab sections of laser media to be used to produce a single powerful laser beam (col. 2, lines 59-62). Hughes further discloses phase-locking of a plurality of laser media (col. 3, line 2). Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention that the lasers in the laser array of Hughes are arranged in close proximity to each other such that a higher-order oscillation mode can be provided to further produce the single powerful laser beam (Hughes, col. 2, lines 59-62).

Regarding claim 13, the modified optical transmission system of Hughes and Scifres differs from the claimed invention in that Hughes and Scifres do not disclose the structure is configured to cause the radiation elements to be emitted with more radiant power in higher-order oscillation modes than in the ground mode of the laser structure. Koyama teaches a method of manufacturing surface emitting semiconductor laser for optical information processing and optical communication systems (col. 1, lines 10-15), wherein a laser structure is provided and configured to cause the radiation elements to be emitted with more radiant power in higher-order oscillation modes than in the ground mode (col. 5, lines 45-50, col. 15, lines 36-52, col. 20, lines 16-22). Therefore, it would have been obvious to a person of ordinary skill in the art at the time

of invention to incorporate a laser structure such as the ones of Koyama for the for the laser structure in the optical transmission system of Hughes modified by Scifres to provide a laser structure that generate radiation elements with more radiant power in higher-order oscillation mode to produce a single powerful laser beam and to further improve the coupling efficiency to the optical fiber (Koyama, col. 20, lines 16-22).

Regarding claim 21, Koyama discloses a laser structure that has a shape of one of a circle and a square (col. 9, lines 26-47 and figs. 1, 7A, 8A, 11) forming an outer border to a part of the structured laser emitting the radiation element (col. 15, lines 53-57).

Regarding claim 22, Koyama discloses the separating structure has multiple rays leading from a center of the structure to a border (52i, fig. 11) of the structure (col. 9, lines 43-47, col. 15, lines 53-57 and 63, fig. 11).

Regarding claim 23, as it is understood in view of the above 112 problem, Koyama discloses the structure is configured as at least one separating structure forming a plurality of lasers out of the structured laser (col. 3, lines 65-67, col. 4, lines 1-10, col. 15, lines 53-57 and figs. 1, 8A, 8B, 11), and the separating structure has multiple rays leading from a center of the structure to the outer border of the structure (62a, 62b, fig. 8B and 52i, 63, fig. 11).

11. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. (US Patent No: 5,048,027) in view of Scifres et al. (US Patent No: 4,688,884) and in further view of Kubota et al. (US Patent No: 5,805,627).

Regarding claim 11, Hughes differs from the claimed invention in that Hughes does not specifically disclose the stimulation of the structured laser is carried out electrically by an

electrode configured to form the structure. Hughes discloses one of the object of his invention is to distribute the electrical and thermal loadings in a solid state laser so that they can be effectively managed as the laser input power is increased (col. 2, lines 55-58). Furthermore, it is well known to use an electrode to electrically stimulate an structured laser. For example, Kubota teaches about fabrication of a laser diode useful for an optical communication system (col. 1, lines 7-10), wherein stimulation of laser structure is carried out electrically by an electrode configured to form the structure (col. 3, lines 64-67, col. 4, lines 1-26). As it is suggested by Hughes and as it taught by Kubota, it would have been obvious to a person of ordinary skill in the art at the time of invention to structure the laser array of Hughes with an electrode to electrically stimulate the laser structure, to further generate a single powerful laser beam.

12. Claim 12 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. (US Patent No: 5,048,027) in view of Scifres et al. (US Patent No: 4,688,884) and in further view of Ohbuchi (US Patent Application Publication No: 2004/0105475 A1).

Regarding claim 12, as it is understood in view of the above 112 problem, Hughes differs from the claimed invention in that Hughes does not specifically disclose the structure is formed upon a carrier material and the structure is oriented in a specific direction relative to a crystal axis of the carrier material. However, making a laser structure that is formed of carrier material and orienting the laser structure in a specific direction relative to a crystal axis of the carrier material, is merely a matter of a design choice providing a specific design and structure for the laser device. For example, Ohbuchi teaches a semiconductor laser device for fiber optics communications (page 1, paragraph 0002) having a laser irradiation portion of different carrier

material (page 3, paragraphs 0043, 0045). Therefore, as it is taught by Ohbuchi, it would have been obvious and is a matter of design choice to choose specific carrier material for the laser structure of Hughes to provide a highly reliable laser device with good electrical and optical characteristics.

13. Claims 16-17 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. (US Patent No: 5,048,027) in view of Scifres et al. (US Patent No: 4,688,884) and in further view of Schreiber et al. (US Patent No: 6,680,800 B1).

Regarding claim 16, the modified optical transmission system of Hughes and Scifres differs from the claimed invention in that Hughes and Scifres do not disclose the radiation elements are emitted predominantly in one of a predetermined distance and a predetermined angle range to an axis of radiation. However, light sources can be positioned and arranged along an optical axis of radiation such that the radiation elements can be emitted in one of a predetermined distance and/or a predetermined angle with respect to the axis of radiation to propagate the light in a specific direction. For example, Schreiber teaches the generated radiation elements (10, fig. 6A, 6B) can be emitted in one of a predetermined distance and/or a predetermined angle to the optical axis (13, fig. 6A, 6B) of radiation (col. 7, lines 32-43). Therefore, it would have been obvious to an artisan at the time of invention that the light sources of laser structure of Hughes can be arranged and positioned such that radiation elements can be emitted in a predetermined distance and/or a predetermined angle to the optical axis of radiation, as it is taught by Schreiber, to provide a specific transmission direction for the generated light.

Regarding claim 17, Schreiber teaches radiation elements can be emitted symmetrically about an optical axis of radiation (light beam group 10 of fig. 6B are emitted symmetrically with respect to optical radiation axis 13).

Regarding claim 19, the modified optical transmission system of Hughes and Scifres differs from the claimed invention in that Hughes and Scifres do not disclose a beamforming element through which the radiation elements pass before entering the multimode optical conductor. However, it is well known to incorporate an optical beamforming element such as a lens along the transmission path of light to converge the light. For example, Schreiber teaches a lens (3, fig. 6B) along the transmission path. Therefore, it would have been obvious to an artisan at the time of invention to incorporate a lens such as the one of Schreiber, along the transmission path of light in the transmission system of Hughes modified by Scifres to direct and converge the light to the transmission medium for further propagation.

14. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hughes et al. (US Patent No: 5,048,027) in view of Scifres et al. (US Patent No: 4,688,884) and in view of Schreiber et al. (US Patent No: 6,680,800 B1) and in further view of Cunningham et al. (US Patent No: 6,064,786).

Regarding claim 20, as it is understood in view of the above 112 problem, the modified optical transmission system of Hughes, Scifres, and Schreiber differs from the claimed invention in that Hughes, Scifres, and Schreiber do not disclose the beamforming element enlarges an optical image of the structured laser on the core, and causing the emitted radiation elements to enter predominately in a predetermined radial distance from the core center. Cunningham

discloses an optical system (col. 3, lines 51-60 and fig. 1), wherein a lens is aligned to receive optical radiation from an optical source and to direct a spot of optical radiation onto a core of a multimode fiber in a predetermined radial distance from the core center (see abstract and col. 4, lines 5-9). Therefore, it would have been obvious to a person of ordinary skill in that art at the time of invention that an optical beamforming element such as of a lens that can be positioned in the optical path in the transmission system of Hughes, as discussed above in claim 19, can enlarge an optical image of a laser light onto a core of a conducting fiber and can cause the radiation to enter the core of the fiber in a radial distance from the core center, as it is taught by Cunningham, to increase the operational bandwidth of the optical transmission system (Cunningham, col. 3, lines 51-60).

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to M. R. Sedighian whose telephone number is (571) 272-3034. The examiner can normally be reached on 9 to 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

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M. R. SEDIGHIAN
PRIMARY EXAMINER